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PEABODY JOURNAL
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THE DUALITY OF THE TEACHERS COLLEGE

HERMAN LEE DONOVAN[1]
President of the Eastern Kentucky State Teachers College, Richmond, Ky.

The teachers college is a new institution. This institution has come into existence within the lifetime of many people in this audience. Just as normal schools were first organized as private ventures, so the first teachers college was a private institution. It came into being about forty years ago. Dean James Earl Russell made Teachers College of Columbia University the illustrious institution which has had such an enviable career. The first state teachers college was established sixteen years later, in 1903, at Ypsilanti. The great majority of teachers colleges are in their first decade of existence, and but one or two are a quarter of a century old.

The teachers college is not a normal school having an extended curriculum, with degree-granting privileges. It differs from the normal school as the full-grown butterfly differs from the chrysalis. A metamorphosis has taken place—it is more than a change of name. Would you think of the acorn as the oak? Then do not think of the normal school as the teachers college.

I would not have you believe the normal school had no virtue. Its purpose was well defined; its function was definitely understood; its objective was clear. It fulfilled its mission at a time when only a limited professional preparation was required of teachers.

The faculties of these normal schools were frequently composed of men and women of limited scholarship, but possessed of an evangelical devotion that almost amounted to a passion for teaching. The students were usually poorly prepared for their work, but they did

[1]Inaugural address, October 25, 1928.

hunger and thirst after imparting knowledge. Emphasis was too often placed on the teaching process to the neglect of the content to be learned. Enthusiasm, often a substitute for scholarship and earnestness, sometimes stood for culture. High and noble ideals and the finer virtues were emphasized. Character of a fine quality usually resulted. The morale of the school was always at high tide. But the frailties of this institution must not be passed on. Faculties possessing little scholarship, students with poor preparation for entrance, small emphasis on content, and a willingness to substitute some other virtue for culture, will not be perpetuated by the teachers college. Some of the fine traditions of the normal school, however, should be preserved. Its lofty ideals, its buoyant enthusiasm, its moral and spiritual tendencies are values which the teachers college should seize upon as a priceless heritage.

The men who wrought in behalf of the normal schools of this country made a mighty contribution to education in America. American education is indelibly stamped with the pragmatism of Page, of Massachusetts; the energy, initiative, and devotion to the Pestalozzian doctrine of Sheldon, of Oswego, N. Y.; the philosophy of Wickersham, of Pennsylvania; the teaching fire of Edwards, of Illinois; and the demonstrations of artistic teaching by the McMurrys. These characters are our wise men from the East who have borne gifts to us who continue to carry on in the teachers college.

The teachers college is not only new, but it is a unique institution. It occupies a peculiar position midway between the vocational school and the liberal arts college, partaking of the nature of each. The teachers college possesses a duality that other vocational schools do not have. The vocational school is interested largely in developing skill, while the object of the liberal arts college is general training or culture. The teachers college must have as its aim the development both of culture and of skill in the technique of teaching. To emphasize one at the expense of the other is to fail to appreciate the dual purpose of the teachers college. This new college must present a valuable content and, at the same time, cultivate the art of teaching.

For nearly a century teachers of the public schools have been the product of either the normal schools or the liberal arts colleges. Between these institutions there has been antagonism. The liberal arts colleges have claimed that the normal schools have taught their students how to teach without giving them anything to teach. They have charged that these institutions have presented methods of teaching, educational theories and practices, and the history of education without requiring of their students a knowledge of the subject mat-

ter. The normal schools have countered by asserting that the liberal arts colleges have crammed the heads of their students full of facts, but have not given them the least idea how to impart this information. "The graduates of the liberal arts college," they say, "blunder along by the trial-and-error process, and, though they may eventually learn to teach, the procedure is wasteful and extravagant."

Doubtless there is a modicum of truth in the claims of both parties to this ancient quarrel. The realization of the truth of the assertion regarding the normal schools probably had as much to do in influencing the leaders of these schools to organize the teachers college with a view of correcting this specific defect as had any other one thing.

The teachers college has a twofold objective. Each of these objectives is of supreme importance. One cannot be thought of as being more important than the other; for if one is ignored and the other exalted, then the institution ceases to be a teachers college and becomes something else. They cannot be considered as primary and secondary, for one is not to be ranked above the other. Rather should they be thought of as the warp and the woof of the fabric, "useless each without the other," so far as fulfilling the purposes of the teachers college is concerned.

The teachers college must do two things for its student: It must lead him to master subject matter and help him to acquire skill in teaching. These two purposes should be integrated as the mortar and the brick which make the wall. Here we have an institution attempting something new. We have no architect's plan by which to erect our structure. We must find a way to develop scholars who are ready to practice the fine art of teaching. The liberal arts college does emphasize the mastery of subject matter, but places no emphasis on any particular use to be made of this content. The medical school is interested in producing a practitioner who will have skill in the practice of medicine. Content *per se* has no particular value to the medical student. He is interested in subject matter to the extent that he may find it functional in the practice of medicine. The teachers college student must acquire a mastery of such subject matter as the race should preserve, for the teacher is the chief agent for transmitting our racial heritage. Content, subject matter, is the stuff with which he must deal in his effort to educate the child. It is one of the raw products which is to be used in the process of education. To be ignorant of that heritage which the scholars call "good" and the race deems worth preserving marks one as undesirable for teaching. The teachers college must also produce in its student an ability

to teach skillfully the children who come under his tutelage. This implies a knowledge of the mental processes involved, as well as an understanding of the laws of learning. A mere academic knowledge of psychology will not suffice. It imposes upon the student the obligation of becoming a successful practitioner. The product of the teachers college must have the ability to bring his children into such relation to subject matter that they will hunger and thirst after knowledge. The duality to which I refer is not a Dr. Jekyll and Mr. Hyde type of dualism. It is a twofoldness that implies no antagonism. These are companionate purposes of the teachers college.

Let us examine each of these purposes separately. What does a mastery of subject matter in a teachers college imply? Certainly, a degree of scholarship which may be appraised as intellectual wealth. This scholarship, which the teachers college must insist that its graduates possess, implies a breadth of vision and an understanding of the history of mankind. A superficial knowledge of history will not suffice. It must be an ability to interpret the struggles of the race from the earliest times down to the present. The behavior of the savage, the crude plannings of the barbarian, and the successive rise and fall of civilizations must mean to the teachers college graduate something more than a succession of events. The institutions which men have built, the governments they have maintained, and the culture they have acquired should be matters of common knowledge to all teachers. History offers a broad background of knowledge of which no teacher can afford to be ignorant. The teacher should be able to interpret the hopes and fears and struggles of the peoples who have inhabited this earth. This implies scholarly attainments in the field of history, economics, and government. The teachers college expects its product to possess this scholarship.

Life is probably best interpreted through an understanding of the emotions. The emotions of peoples are best expressed through their literature, art, and music. These branches of subject matter become the object of study for all those who would participate in transmitting the culture of the world to the rising generation. The teachers of this land must know something of the world's great literature. They must drink deep of the Pierian spring. Only things of great value stand the acid test of time and endure through the ages. The ancient literature of the world is a possession the teacher cannot pass by. The Bible, Homer, Virgil, Dante, and the productions of other writers of those far-away ages must not be unfamiliar to us. A knowledge of the literature of contemporaneous civilizations is essential if we would understand how people feel and think. The teacher

should turn to books "as means of purifying his tastes, broadening his sympathies, and enhancing his joy of life."

To him the columns of our buildings, the arches of our temples, and the spires of our churches should tell a story of the passions of the Greeks for beauty, the longings of the Romans for strength, and the striving of the peoples of Western Europe during the Middle Ages after God.

The teacher is not expected to be a musician, except for the few who will specialize in this phase of the profession. But every teacher should be a connoisseur of good music. The culture which comes from an appreciation of the great symphonies, oratorios, and operas is a value that one cannot afford to neglect.

To summarize, the teachers should know literature, art, and music; for they are, in a sense, the very essence of what he must teach.

In the modern world in which we live it has been left to the mathematician to

> Rift the hills, and roll the waters,
> Flash the lightnings, weigh the sun.

Mathematics has been made the handmaiden of science. Everything has been reduced to measurement, and all measurements are the application of mathematical formula. A knowledge of the rudiments of mathematics is essential for all teachers. In a teachers college we recognize no real antagonism between subjects, and we do not consent to have one considered of higher value than another. As President Eliot said long ago: "We should have them all, and at their best."

The period in which we live has been called the "scientific age." Aladdin with his wonderful lamp never performed such magic as our scientists are doing today. In the laboratories of the chemist and the physicist, the biologist and the bacteriologist, new discoveries are almost daily being produced. By the application of the scientific method to new problems of life it does appear that the dream of the poet may some day come true:

> All disease quench'd by Science, no man halt, or deaf, or blind;
> Stronger ever born of weaker, lustier body, larger mind.

All science becomes the legitimate field for the exploit of the teacher. The secrets of life lie hidden in its deepest recesses. He who has the courage to venture into these unknown parts will be richly rewarded. There is a body of well-organized knowledge which every teacher of children must possess. The teachers college is attempting to furnish its students with this information.

Among the major fields of human action are industrial and practical arts. In the curriculum of the teachers college provision is made for introductory courses, that the student may have at least a limited insight into industry and manual and domestic arts. A vocational training is not possible, nor is it essential.

This is but a brief survey of what the mastery of subject matter in a teachers college implies. It is made here for the purpose of emphasizing to the public, and the lay public in particular, that the teachers college is a full-fledged college, understanding its function and purpose, and that it is taking its place alongside of other vocational schools of collegiate rank. Gone are the days when review courses of the elementary school subjects constituted its curriculum. It has no apology to make for its past, no alibi for its mistakes. It believes it understands its mission; it is confident of its future.

All knowledge is our province. Teachers must know more than people engaged in other vocations. They are the guardians of the culture of the race. This has not been true in the past, nor is it true today. But it is the happy dream of the teachers college that some day this ideal may be realized. Without hope there is no progress.

The teachers college graduate must of necessity be the finest product any college can produce. The very nature of his work makes it imperative that this be so. Scholarship, culture, character, a dynamic citizenship, vision, ideals, and professional skill are attributes which are demanded in the discharge of his duties.

This is one phase of the duality to which I refer. Let us turn to the other.

One may have academic learning without the ability to teach. There never was a more absurd thesis than that frequently championed by the academician—viz., if you know a thing, you can teach it. There is just as good basis for the proposition that, though one may never have had a surgical instrument in his hand, if he knows thoroughly each step necessary for the removal of the appendix, has that organ definitely located, and possesses an academic knowledge of the literature on operations of this character, he is capable of performing the operation of removing it. Even the poorest informed layman recognizes that such an operation would prove fatal. Yet it is our custom constantly to place in charge of little children people who have secured only an academic training and to call them "teachers." If we knew how to visualize the scars which they leave on the minds of those intrusted to their keeping, as we can observe the scars of the bungling surgeon, the public would probably become deeply concerned.

It is much more difficult to observe the mistakes of the crude teacher than it is the error of the ignorant physician. The teacher does not have the undertaker checking up on him. But the mistakes in the realm of the mind are no less disastrous. Who knows how fatal a wrong attitude may prove, what baneful results may follow the wrong habit, how expensive an imperfect skill may be, and how damnable the wrong ideal? Yet these are the injuries constantly being inflicted upon plastic minds by those who may know the subject matter and not know how to teach. A high quality of teaching skill is probably one of the most difficult arts to attain in the whole gamut of human achievement. How, then, can the public expect teaching skill to be acquired in any but a college whose business it is to perfect this skill in its students? To the teachers colleges of America is gradually being assigned the task of the preparation of the practitioners of that profession which has the greatest possibility of affecting human welfare. The public, as attested by the acts of legislatures in establishing and maintaining teachers colleges, is committed to the idea that teachers henceforth shall be educated in professional schools of college level. And very shortly, even within our lifetime, you are going to demand that every teacher of children be a college graduate. Presently we are going to abandon the old notion which has so long been current that any one who has a limited education can teach little children. The public will find out, as the profession has already discovered, that it really takes more teaching ability to teach young children than older boys and girls.

The question has probably already arisen in your mind as to the manner in which this teaching skill is acquired. In the law school, skill in the practice of law is acquired to a degree in moot courts and by the observation of actual court procedures. In the medical school, skill in the practice of medicine is acquired in the hospital, which is always an integral part of the medical college. Likewise the training school, which is the very heart of the teachers college, is the place where much of the technique of teaching will be learned. The student will acquire much skill through the observation of demonstration lessons artistically taught. We learn to do by seeing as well as by doing. Gradually the student may be permitted to participate in the teaching, but not until every detail of the performance has been demonstrated by experts. The training school, then, is one of the chief agencies of the teachers college for producing teaching skill, but it is not the only one.

Psychology, principles of teaching, and methods courses are usually referred to as the professional subjects of the teachers college. The

term "professional course" is, as Dr. Bagley has pointed out, a misnomer. Psychology, principles of teaching, and methods may be taught in an academic fashion and contribute nothing to the art of teaching. How often have we seen individuals well acquainted with the rules of grammar butcher the English language! Unless the psychology is applied, the principles of teaching observed, and the methods practiced, they are about as worthless as Hamlet's reading of words, words. When these subjects are taught in relation to the work of the laboratory, which is the training school, they have a very vital part to contribute to teaching skill.

A very potential source for developing teaching skill is in connection with the teaching of the traditional subjects. The point of view in presenting a subject in the teachers college will differ materially from that of an academic institution. The application to be made of the content which the student is learning must be constantly before both the teacher and the learner. The instructor will find it necessary frequently to pause and say: "Now, in the teaching of this particular material to children I would proceed in this manner." At other times he will point out the fundamental principles of teaching or of the method to be pursued with children. The mental processes involved in the learning should frequently constitute a theme of discussion even in the history, mathematics, English, or modern language courses.

I would not leave the impression, however, that we shall find it necessary to teach children all that we learn in college. One will find that he always must work hardest on the things he does not teach. The teacher must have a broad background of knowledge which does not appear in his teaching. As George Herbert Palmer has so aptly said: "I cannot teach right up to the edge of my knowledge without a fear of falling off. My pupils discover this fear, and my words are ineffective. They feel the influence of what I do not say." The instructor can set no limit to the knowledge he himself must have of his subject.

Professor Pendleton has forcefully said that we should have "a dynamic professional attitude toward content." Others have called it the "professionalization" of subject matter. "The subject-matter course in a teachers college," continues Professor Pendleton, "must be tinged throughout with a personal appeal, an inspiration, a grip on the student which is different from that prevailing in a typical academic college. Teaching is a service; it is altruistic; it aims to give, to uplift, to inspire, and to develop other persons directly to benefit humanity. In an academic college a student may seek wisdom for

himself alone. . . . There should be in a typical teachers college course a strong ethical quality, permeating every topic, which points students toward a life of intelligent service. It should be specific, professional, thinking always about teaching."

The art of teaching is acquired through long and persistent effort on the part of the student as he passes through all the courses he pursues in the teachers college. Each effort of his will make its ever so little contribution to professional skill. The content courses, the observations and practice in the training school, and the theory courses gradually build up within him a possession that will not pass away, and we will call this gift the "art of teaching."

These two phases—the attainment of scholarship and the art of teaching—constitute the duality of the teachers college. This is my interpretation of the purpose of the institution to which I am called to serve. This institution is pledged to quality rather than quantity production.

In this address I have elected to define the professional function of the teachers college rather than our relation to the state. I have chosen to do this because the purpose of a teachers college appears to me to be less well understood by the public. Briefly, I may say we recognize that we are the agent of the state whose business it is to prepare the best teachers we are capable of producing to the end that the children of Kentucky may have life and have it more abundantly.

PROCEDURES AND RESULTS OF EFFORTS TO REORGANIZE SCIENCE INSTRUCTION IN THE UNIVERSITY OF MINNESOTA

EDWARD MONROE FREEMAN
University of Minnesota

The last seventy-five years of Western World history may be called the "Age of Science." Practical applications of science are universally recognized as the source of comforts, luxuries, and necessities unknown to our fathers. Even that hypothetical person known as the man in the street now talks glibly of science and the scientific method. He is for or against evolution and may even allude artfully or guardedly to Einstein, with the hope, perhaps, that his audience will assume that he understands relativity. He actually believes nothing is impossible to science, as witness the equanimity and gullibility with which every new newspaper announcement of an artificial synthesis of living substance is received. Of course, he does not realize what a transcendent achievement such a synthesis, if accomplished, would be; nor can he understand that even the hope of accomplishing it is only some biologist's vague dream, with little, if any, immediate prospects of fulfillment. He accepts it placidly in the name of science. Of course, he may not believe in evolution, but about this he may know as little as, if not less than, some of his brother advocates of the same theory. He takes his evolution in the same way as he takes his party platform, without a too embarrassing understanding of its meaning.

Science is taken for granted in medicine, business, engineering, agriculture—everywhere. Even the pugilists boast, and I suspect with some justification, of a scientific method.

Science has quite naturally assumed, therefore, an important position in the teaching and research of institutions of higher learning. From the laboratories and classrooms of such institutions come the technically trained men and women who will solve the theoretical, fundamental science problems of the future, or point the way to practical applications of science. From the same institutions come increasing hordes of other graduates, not trained especially in science, but also generously thought to be educated men and women of whom

we may have, perhaps, a right to expect that they have an intelligent understanding of science and its relation to human affairs. It is in these two groups that we may visualize most concretely the larger aspects of our problems in the teaching of science in universities and colleges.

SCIENTIFIC INVESTIGATION OF SCIENCE TEACHING

Science teachers are human beings, and, as such, are not exempt from some of the failings of the human race. It is a common saying that shoemakers' families are poorly shod. Doctors are not physically perfect nor even always hygienically discreet. In a like manner, as far as my own observation goes, science teachers do not always do things in a thoroughgoing scientific manner.

CAN THE LABORATORY METHOD BE SCIENTIFICALLY JUSTIFIED?

I can think of no better illustration of this than in the well-known and almost universally revered method of teaching known as the laboratory method. Now, any particular science—let us say botany, for instance—has a body of information accumulated and tested by careful observations in the field and by repeated experiments. When the scientist can, at will, so control the environmental factors by laboratory methods that he can, without fail, reproduce certain phenomena in nature, it must be admitted that he has a scientific understanding of those phenomena.

The laboratory has been the great source from which our sciences have been constructed. There can be no doubt of this fact. What more natural, then, than to assume that in teaching of science the laboratory method is the essential feature? For more than a half century this view has held almost undisputed sway. It has become a creed, an educational idol. To teach science in college without some or all laboratory exercises would stamp the teacher as a scientific heretic. And we may as well admit candidly that this method has been, as every one knows, a costly method. Space, special and costly equipment, expensive materials, and small classes, all conspire to raise this cost to probably at least twice, and, in many cases of even elementary science, to three times or more the cost of teaching history and English classes of the same level. Possibly it is worth it, but has any one experimental proof? Now, does it necessarily follow that since the body of information known as chemistry has been built up from laboratory experiments, such information can be taught only by the same method? Every science teacher knows that it is humanly impossible to have every fact taught to his class worked

out independently by the student. These facts are legion, and are the accumulation of ages and the results of intricate and elaborate experiments, often possible of repetition only by master scientists.

But, says the science teacher, the student should learn how these facts are determined. We agree, but ask in return: *How often* does he need to learn this method? Of course, the science teacher will now point out that there are values in the laboratory method other than the accumulation of facts. What are these values? At the University of Minnesota each teacher of elementary science was asked to enumerate the functions of the laboratory in his science. In the thirty-five replies were forty-three categories of functions. Many of these probably would be identical, but the reader could not be sure that such was the case. The details of this questionnaire are not important here. The point is clear that, by and large, many functions are claimed for the laboratory method. Last year at the University of Chicago summer session a questionnaire was prepared for teachers of science in secondary schools to obtain expressions of opinions as to the values developed by laboratory work which they themselves had received from courses in science. Thirty-five different values were recorded by thirty-seven instructors. Again, large claims for laboratory methods. I am not disposed to dispute the claims of either group. The questions I would like to ask, however, are those that I think a scientist should be willing to answer in a scientific manner. That is to say, I would like to have the science teacher apply his laboratory method in obtaining the data for the reply to my questions.

1. Have you experimental proof, by the laboratory method, that the laboratory method in your particular course is actually more effective than some other method—e. g., lecture demonstration?

2. Have you experimental proof, by the laboratory method, that the functions you think your laboratory method subserves are actually operative? For instance, if you say the laboratory develops manipulative skill and the power of observation, can you state that this is actually so and demonstrate it by the laboratory method?

These, I believe, are fair questions, but I have not seen any answers.

I hope I have made clear my point that science teachers are human and do not always use their science. I have used the laboratory method merely as an illustration of one of the problems needing investigation and experiment. There are many other problems, perhaps of equal importance, in the teaching of science in colleges and universities.

AN INVESTIGATION UNDER WAY

About two years ago a committee on teaching science was organized, under the all-university committee on educational research of the University of Minnesota, to consider these problems and, if possible, to stimulate, initiate, coördinate, and assist experiments in this field. The nine members of the committee are all actively engaged in teaching science and represent six colleges and nine departments of instruction in pure and applied, elementary and advanced specialized, science. Only one member hails from the College of Education, because, after all, this is the scientist's job—to investigate his own teaching methods by means of his own methods of investigation. From the beginning it became quite clear that such investigations must be largely coöperation, in which science teachers, assisted in the laborious details of tests, collection of statistics, and other procedures by students in education, must take an active part. It was also clear that not all of the group of problems which presented themselves on an analysis of the situation could be attacked at once. Here and there, perhaps, a science teacher becomes interested in a particular problem, as, for instance, class size or the function of laboratory work. The committee stands by to aid and abet and to promote the publication of the results. There can be no question of the interest which the scientists have in these problems. Their scientific methods have been challenged. They are invited to use their science to demonstrate the efficacy of these methods. No self-appointed educational expert is laying down dictatorial rules and regulations for teaching. We are merely asking the plain but somewhat irritating question: Exactly what are you trying to do in your teaching? Are you doing it? Can you measure your results quantitatively in a scientific manner?

Analysis of the Field of Science Instruction

While the interest of scientists from all over the University was encouraging and gratifying, it became clear that every science teacher or department could not immediately engage in a wholesale program of educational investigations. It was also clear that many would be willing to assist and coöperate in the solution of such problems as might be advantageously attacked in their particular fields or departments. To clarify the situation and to bring about the best coördination and coöperation, the committee undertook to survey and analyze the whole field with a view of setting before the science teachers of the university such a picture of outstanding problem fields and the opportunities of investigation as it might be able to present. In

such a picture it was hoped that individuals, departments, and colleges might find incentives and opportunities for research contributions to these fields. The results have been even greater than our expectations.

Since this suggested program of investigations, having in mind the improvement of instruction in science, has been published,[1] I shall only indicate the scope of the outlines by presenting a few typical questions in each field.

A. *The curriculum in science.*

(1) An analysis of existing conditions would seem to be a logical starting point. What courses in science are now offered? In what colleges? What are the relations, sequences, and overlapping in such courses?

(2) The study of prerequisite courses is of special interest. Are prerequisite courses actually functioning? What are the outcomes of elementary course instruction?

(3) Studies to improve the correlation among existing courses would have a natural basis in the analysis of existing courses and the studies on prerequisites. Can prerequisite courses be devised which will more fully meet the requirements of the more advanced courses? Can advanced courses be modified to utilize more completely the previous experiences and training of the students enrolled? What relationships are there between courses and final occupations? Are there needs for new courses which can be met?

The answers to such questions as these and others of a similar nature would make clearer ways and means of automatically providing for a continuous and progressive reorganization of the total curriculum.

B. *Aims and objectives of instruction in science.*

Changes in our social, industrial life, changes in the amount and nature of our scientific facts, changes in college enrollment, and obvious inadequacies of existing courses call for an occasional resurvey of our aims and objectives in any given course in science.

(1) The literature of science furnishes considerable basic data, at least of historical interest, embodying the views of scientists of other generations.

(2) A systematic canvass of authorities now competent to speak on the subject, at least those who have been conceded outstanding

[1] *Problems of College Education*, University of Minnesota Press, 1928.

success in the teaching of science, would reveal contemporary opinion on the present aims and objectives held by such teachers.

(3) Study of student personnel. Whether we like it or not, the attitude of the student is of great importance in the success of science teaching. What are his expectations? What are his future occupations? What has he a right to expect? Is he getting what he wants or needs?

(4) Study of alumni occupations. What are the actual results of science courses on the success or failure of alumni? What do they say concerning these courses? What can be done about it?

C. *Methods of instruction in science.*

Investigations must always have their roots in the historical past or the present.

(1) Canvass of present methods. What methods are now in use? How are they conducted? How does Millikan teach physics? How does Thorndike teach educational psychology? Analytical study, complete and intense, would serve a useful purpose in clarifying the values at present attained by outstanding teachers of science.

(2) Experimental investigations. Are we justified in assuming that the laboratory method is universally applicable or the most efficient method of teaching science? Is it possible that other known methods may be equally or more effective? Would it be possible to give specific and scientific tests to comparative studies of the laboratory method with such methods as lecture, demonstration, project, problem, research, textbook, and many others? Is it logical that one who is constantly searching for truth, and teaching that truth, should be complacently blind to the facts involved in one of his most important functions—viz., the method of conveying the truth to his students? Investigations into the methods of teaching science call loudly for volunteers, and that call is directed not primarly to students of education, but to teachers of science. We teachers of science must answer the call. We are, as it were, in a trap. As teachers of science, we are expected to justify by our own scientific methods the methods which we use to teach. I see no way out of this predicament except that of honest investigations such as we use in our research in any science field. And the newer educational expert, be he educational psychologist or even a domineering dean, an expert who no longer assumes omniscience in the field of methods of teaching, but who, in a most embarrassing manner, merely asks for quantitative measures of results in terms of our own beloved means, standard deviations, and probable errors, will be the first to welcome us in this field of investigation.

D. *Measurement of achievement in science.*

We all fondly hope that in our college science we impart large quantities of information in addition to valuable habits of thought, observation, manipulation, etc. Consider the values a student may obtain at, for instance, the University of Minnesota if these fond hopes of science teachers are actually realized. These instructors listed forty-three kinds of values received from laboratory work alone. What are the actual results of our teaching? What units of measurement have we? Have we valid and reliable means of measurement? Can we measure the different values—for instance, plain facts, on the one hand, and sound judgment from given facts, on the other hand? Do our marks measure achievement? How far does student personality affect our estimate? Does our teaching actually, as often claimed, contribute to building of fine character in the student? How long does the student retain the information we impart? Does he retain all the values equally? Questions almost without number crowd in upon us in this most significant phase of science teaching. If there is one thing upon which the scientist is supposed to pride himself, it is upon his reliance on demonstrated facts and proved experiments to form judgments of the sequent phenomena which we call "cause and effect." Does he do this in his teaching? Search the vast libraries for such observations and experiments, and you will find that they are even as rare as the proverbial dental equipment of domesticated fowl. We need to start at the bottom of this problem, since that is where we actually were at the beginning and still practically are. We need the simplest tools for measuring our results—methods for measuring outcomes of our teaching. I am not unmindful of the fact that measurements of teaching have been made in many fields and even in the field of science, but I am not aware of more than a few attempts by those scientists who are actually doing the teaching in our universities and colleges and in whose classes and laboratories the values can best be studied. One is frequently confronted with the statement that high-school teaching is superior to university teaching. Mr. Science Teacher, will you tell me if this is true or false and cite your authority or proof? Apparently high-school teachers have made more studies of their methods. To what extent are the values imparted intangible? Certainly many claimed values are not yet measured and perhaps not possible of measurement. But how seriously have we tried to measure these values?

E. *Costs of instruction in science.*

The cost of science instruction is admittedly high. If the results of the teaching are entirely satisfactory, the high cost should not

necessarily weigh against the maintenance of science courses. Intelligent science teachers are conscientiously attempting to effect economics wherever possible. They are appreciating the acute problems of colleges and universities in the tremendous registration increases, taxing to the limit their resources. We shall be compelled to consider costs of instruction unless some unforeseen and almost limitless source of support appears. Can we reduce the cost of science instruction without a loss or even with a gain of efficiency? The problems of cost of instruction necessarily await the measurement of achievements and are related to other problems of science teaching. They constitute a group of problems of vital interest to science as well as to our institutions as a whole.

EXPERIMENTS AT THE UNIVERSITY OF MINNESOTA

The above comprehensive survey of the problems of teaching science in the university was presented to representative teachers and to departments of science instruction, with the suggestion that the committee in charge would welcome any coöperation and give any possible assistance to an experimental attack on the problems involved. A healthy interest has been developed. One of the best results, in my opinion, has been the response to the challenge to teachers to produce scientific proof of the attainment of their teaching aims and objectives. Like other colleges and universities, we have tried to improve our teaching methods by various other methods, such as lectures by educational experts, discussion groups, seminars, etc. I am personally of the opinion that among the teachers of science the presentation of the improvement of teaching as a problem in science to be solved by experimental quantitative methods arouses more active interest, constructive thought, and real action than any other presentation with which I am familiar.

Medical School Investigation of Dissection

It may surprise you, as it did many of us, to know that the first experiment suggested was presented by the Department of Anatomy of the Medical School. The subject was somewhat gruesome—viz., to determine the relative efficiency of two-student and four-student groups working on a cadaver. That the subjest is, nevertheless, alive can be attested by those who know the cost of cadavers. Ninety-four students were included in this experiment, which ran for two quarters. Fifty-two of these students were individually paired on the basis of as many tests and characters as were available. All factors other than the grouping of the students were kept as uniform as

possible. Those students working in twos in one quarter were in fours in the next. Great pains were taken to obtain accurate and exhaustive data on achievement. More than one thousand separate items were included in the tests and examinations. The experiment was conducted by Dr. C. M. Jackson, head of the Department of Anatomy, with his assistants and with the aid of Mr. A. W. Hurd, a graduate student and instructor in the College of Education. The results of this experiment were summed up thus in the conclusion:

> No evidence has been procured which shows any reason for furnishing a cadaver for every two students. If there are benefits to be derived therefrom, they have not been evident in any of the data of measurement. . . .
>
> In extensive written examinations, in quizzes, in identification of anatomical structures, in general work in the laboratory, the students who work in fours seem to do as well as students who work in twos. When data regarding groups of paired students, all students in comparable groups, individual students paired with one another, or given individuals working under the two compared conditions, are examined and studied, no evidence shows a superiority of either procedure over the other.

Opinions of Instructors and Results of Investigation

Answers to a questionnaire at the end of the course, in which the five instructors recorded their preference for two-on-a-body groups, give a number of reasons for such preferences. The bearing of the results of the experiment on these statements is appended:

1. It enables each student to do more individual dissection.

This introduces the question of aims and objectives of the course. What is the function of the Anatomy course? Possibly, if skill in dissection is an important objective, opportunity for more practice in dissection offered by groupings in twos would be desirable. In order to verify this, measurements should be made on this particular matter. It cannot be accepted without more proof that the greater opportunity offered in dissection by groupings of twos over that offered by groupings of fours would actually of itself produce more such skill. It seems reasonable that, as opportunity for acquiring skill in dissection is given later in the curriculum, the informational function of the course is its major function.

2. It affords more opportunity for development of initiative and self-confidence.

Initiative and self-confidence are certainly desirable, but there is no proof that these are obtained from groupings of twos over those of fours. It might even be argued that meeting the competition of three others successfully would stimulate these characteristics more fully.

3. It gives first-hand information.

As to the first-hand information, the measurements all indicate as complete information by those working in fours. There may still be a question as to whether they will retain this information as long a time.

4. It is difficult to get four who work well together.

5. The weak student is compelled to do the work for himself.

6. Four is too much of a crowd.

There is no evidence available to substantiate these last three contentions. Number 4 may be true, but evidently the difficulty is not insurmountable, merely an inconvenience. Number 5 does not prove that possibly a weak student might not gain more real knowledge of anatomy by being allowed to work with stronger students. Number 6 represents merely a feeling not substantiated by any of the facts brought out. There may be preferences which might receive recognition if no other reasons contra-indicated. Apparently no serious damage would result by denying such privileges in this matter.

The questionnaire returns from the students give a large majority preference for the groupings in twos—seventy-five for, fourteen against, with two having no preference. The fourteen voting in favor of the grouping in fours did not receive higher marks when working in groups of fours. Therefore, it seems an unprejudiced vote.

The advantages summarized for each of the groupings are interesting. The arguments for the twos are similar to those given by the instructors and have been discussed.

The advantages summarized in favor of the groupings in fours seem fairly well concentrated on the saving of time by division of labor and the advantages of more opportunities for discussion.

How much student and faculty opinion is influenced by the prevailing procedures which had been followed for some time is unknown. It is evident that the facts have not substantiated the opinions expressed in favor of the groupings in twos. It seems reasonable to believe that if there were such overwhelming advantages of the twos groupings, it would have shown up somewhere in all the measurements made.

Science teachers are usually not radical, though they may not always be conspicuously conservative. I do not know that the Department of Anatomy has planned in the future to adopt four-on-a-body instead of two-on-a-body groups in the Anatomy course. I do know, however, that if the cost of cadavers becomes excessive, the department may adopt the four-on-a-body grouping without any great fear of a decrease in the efficiency of their teaching work.

How Much Laboratory Work in Medicine?

A considerable number of additional problems have been undertaken at Minnesota in the two years since this work was begun. Time will not permit more than a brief mention of most of these.

In the Department of Human Physiology, in the Medical School, two experiments were carried on to determine the effect of different amounts of laboratory work, with the substitution in the first experiment of two and one-half hours of library work per week for an equivalent amount of laboratory time. The control class had seven

and one-half hours per week. Apparently the all-laboratory group had a better achievement record except in the final oral examination, where the judgment of instructors may have been prejudiced. A considerable number of students in the library section showed individual achievements superior to their paired mates in the all-laboratory section. In other words, for the majority of students the all-laboratory method resulted in the greater achievement, while for a minority the library-laboratory method was superior. In the second experiment, for two and one-half hours per week of laboratory work a total for the quarter of eleven hours of lecture work in biophysics was substituted. The results showed slightly higher achievement in the biophysics group, but cannot be considered conclusive on account of small numbers involved and particularly because of facts gained subsequent to the experiment, showing that many of the biophysics group had had a previous course in physiology.

Experiments in Physics

An extensive series of experiments has been carried on by Mr. A. W. Hurd, of the College of Education in coöperation with the staff of the Department of Physics in the College of Science, Literature, and the Arts. Briefest mention of these will have to suffice. The objectives of these experiments centered around the problem of determining the differences in the achievement of certain architectural students in a class in mechanics and of other groups who might be compared with them. Stated in another way, the objective is to determine the value of a two-hour-per-week period in the mechanics laboratory. All students are required to attend three lectures, one quizz, and one double-period laboratory class per week, except that the architectural students do not take the laboratory. The conclusion reached was that there is some evidence to show that laboratory work on the part of architectural students would raise their achievement records, but no evidence to show that some other activity might not raise it as much or more. In the course of the experiment, opportunities for work on various sub-problems on technique and method presented themselves. A study was made, for example, to determine additional bases for pairing students in such experiments. Comprehensive preliminary tests were conducted, and comparisons of the various groups were made. The value of scaling individual test items of such preliminary tests was also experimentally determined from the difficulty of each test item. The achievement of high-school students in physics has a possible bearing on the pairing of students for experiments in physics and was investigated in considerable detail. Other phases included

validity and reliability of the preliminary tests, the scaling of the preliminary tests, problems on the measures of achievement, and effect of class size in physics. The conclusion on the last problem is of general interest:

> There is additional evidence that class size is not a significant factor under present instructional conditions. Achievement seems to be more a matter of individual incentive, capacity, and effort.

A Study of a Prerequisite Course in Botany

The latest study, and one of the most exhaustive, has been a curriculum study in the field of elementary science. The central theme has been an analysis of the course in Elementary Botany, a required course of three credits per quarter for three quarters, taught in the College of Science, Literature, and the Arts, and the relations of this course as a prerequisite to the sequent courses in plant science in the College of Agriculture and Forestry. The investigation was performed by Mr. P. O. Johnson, a graduate student in Education, with the coöperation of many members of the faculty in the Department of Botany of the College of Science, Literature, and the Arts, and of four departments of the College of Agriculture and Forestry. Careful analyses of subject matter were made of the course in Elementary Botany and of the twenty-one courses in the curricula of Agriculture and Forestry, for most of which the Elementary Botany is a specified prerequisite. The units of the analyses were the commonly accepted sub-sciences of botany, such as morphology, physiology, taxonomy, etc., adapted to the particular conditions of the courses compared.

The percentages of time and subject matter devoted to each unit were determined and compared. In general, the comparisons indicated a very high degree of similarity in the stresses laid on the important units as taught in the course in Elementary Botany. In such a large number of technical sequent courses in fields as broad as Agriculture and Forestry it was inevitable that the stresses in certain of these courses would not agree. A conspicuous disagreement was in the unit of taxonomy, or the classification of flowering plants. This unit has been practically entirely omitted from the Elementary Botany and appears with a stress of 15 per cent or more in ten of the sequent courses, of 25 per cent or more in four courses, and of 63 per cent in one course. Provision for this unit has been made in the optional electives in the third term of the Elementary Botany. It is, of course, to be expected that such a technical course as Wood Structures, dealing with the gross and microscopic structure, characteristics, and uses of wood, would place a larger emphasis (65 per cent) on plant

histology than the 16.5 per cent which the elementary course in Botany provided. The only units found in the Elementary Botany which were apparently not used at all in any of the sequent courses were algology, or the study of the algæ, and comparative morphology, which includes in general a comparison of plants of various groups with a view of establishing relationships. In defense of the latter it may be said that it probably functions to some degree at least as a basis for taxonomy of flowering plants, the unit noted previously as being entirely absent in the elementary course.

Since the agreement of emphasis on the units involved is very large, it would seem that the Elementary Botany should function to a very high degree as an effective prerequisite. That this was not the case became evident from the careful analysis of the sequent courses and from the results of achievement in sequent courses of students with and without the prerequisites. It became quite evident that in many of the sequent courses the actual material appropriate for Elementary Botany, rather than sequent material, was being taught. In other words, the students were receiving partial repetitions of Elementary Botany in these courses. In addition, of course, the applications of botany to these particular professional courses were stressed.

The investigations of Mr. Johnson have produced a large number of interesting data and conclusions of significant value in a consideration of the organization and coördination of plant science courses in the colleges concerned. Any detailed discussion would demand time not now available. One general observation may be selected, however, as having an important bearing on the place and function of such an elementary science course as Botany. It is obvious that the emphasis in the Elementary Botany course could not possibly coincide with the emphasis in twenty-one sequent courses.

The Larger Difficulties in Readjustment

On the other hand, the course as taught was as satisfactorily weighted in emphasis as one can reasonably expect. Where, then, lies the difficulty? The answer, I believe, lies deeper. It involves not merely the aims and objectives, but also certain historical values. Botany, like all the other natural sciences, has expanded enormously in recent years. Whole sub-sciences, such as plant pathology and plant breeding, have practically been entirely developed or have grown to outstanding importance in the last twenty-five years. If Elementary Botany is to ground the student in all the elements of botany or plant science of today, it must include a vastly greater amount of

material than was included twenty-five, or even fifteen, years ago. On the other hand, the student's curriculum has had similar demands on its time from many other fields of learning. Moreover, the demands for professional and vocational training are constantly becoming more specific, even though one labors desperately to retain the undoubted values of a broad and basic training in fundamentals. We are faced with new conditions which present problems for which we must find a solution or some readjustment of our methods or contents of teaching.

The Aims of a Course in Elementary Science

The functions of an elementary science course may be grouped into three large categories:

1. Informational, involving the basic elements of that field especially as a foundation for use in professions or vocations.
2. Orientation, involving the relation of that science to human, social, and industrial life.
3. Cultural, involving the more or less intangible values called "scientific method," "powers of observation," etc.

While the last of these is of undoubted importance, we have little or no quantitative measure of results. Presumably these values may be obtained, or at least claimed, for a great variety of methods of teaching science, and, therefore, need not be further considered at this time. Can a modern course of elementary science serve both of the first two functions, information and orientation? The expansion of knowledge noted above and the enormous complexities of our modern social and industrial world both increase in like manner the demands on our elementary science. Yet the student cannot afford any more time than, if as much as, he was formerly given. It seems possible, therefore, that we shall be compelled to reorganize our courses in such a way as to distribute the emphasis in accordance with the needs of the student's professional or educational objectives.

A Reorganization of Elementary Botany

At the University of Minnesota, the Department of Botany has, independently of and now greatly encouraged by the investigations of Mr. Johnson, decided to introduce next year a revision of the Elementary Botany, attempting to redistribute these emphases. Instead of a three-term course devoted entirely to a general survey of the field as given heretofore, the orientation values will be concentrated in a lecture-demonstration one-quarter course given to all students. Immediately following this, special elementary

courses emphasizing the special fields of botany will be offered. Taxonomy, Physiology, and Ecology are examples of such courses, which will be largely laboratory courses dealing more thoroughly with the subject involved. A year's work in botany will, therefore, now include one quarter of orientation followed by two one-quarter laboratory courses in special fields. As illustrations of the possibilities, students might be expected to select such arrangements of laboratory courses as follows: silviculturist, physiology, and taxonomy; wood technologist, histology, and taxonomy; horticulturist, morphology, and physiology; plant pathologist, morphology, and physiology. It is, of course, understood that botanical training is by no means complete after these elementary courses. It is obvious that other courses will be necessary. But it is also hoped that duplication and repetition will hereby be reduced to a minimum. Whether or not this is the correct solution, only time will tell. It is planned to attempt to compare quantitatively, if possible, the results obtained with those from the older methods.

SUMMARY

In broad conclusion, two general statements may be, I believe, safely formulated on the basis of the experimental work on the teaching of science at the University of Minnesota:

1. Experimental proof will be necessary to justify the doubtful claims now made for our teaching of science in so far as method, contents, and results are concerned.

2. We shall need to discard some of our conservative worship of established methods and indulge in some bold experimentation in developing newer and better methods of teaching science if science is to hold its proper place in the curricula of our colleges and universities.

THE CURRICULUM OF THE RURAL HIGH SCHOOL[1]

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In preparing this paper, the writer has in mind primarily the typical, or usual, four-year high school with a faculty of from two to five teachers. This position is taken in the light of the fact that although there are a good many junior-senior high-school organizations in the rural districts, nevertheless the great group of rural high schools the country over at present are of four years' duration and are usually built upon an elementary school of seven or eight grades.

The very fact that educators nation-wide are divided in their opinions as to just what should constitute the curriculum of the rural high school shows that the matter is of serious import. As yet, disagreement is quite as pronounced among the specialized workers in the particular field of rural education. This but emphasizes the fact that it is a real problem. Consequently the speaker prepared this paper with the full expectation of having dissenters among his hearers.

The paper comprises a discussion of a few fundamental ideas. These are basic to the whole field of secondary education, as well as to the special field of the rural high school. Each of these principles will be discussed only very briefly.

EIGHT PRINCIPLES OF CURRICULUM CONSTRUCTION

1. *The Fundamental Purpose of All High-School Education is Liberal and General in Its Nature.* I think the workers in the field of secondary education, after all is said and done, will agree that the primary purpose of any type of secondary education should be of such a nature that general values will be stressed. This does not mean that there is not a place in every high-school curriculum for certain types of vocational work or certain courses of a broadening and finding nature. It does mean that the basic purpose of all high-school education is not and cannot ever be of a strictly vocational or a trade-training nature.

2. *When a High School Can Offer Only One Curriculum, This*

[1]A paper read before the Rural Education Section of the National Education Association, at the Boston meeting, February 25, 1928.

Should Be of a General, or Liberal, Type, with Variables Bearing on the Vocational Life of the Community. This second principle is, in a way, a corollary of the first one, but of enough importance to bear repetition. Of course, the number of variables offered by any high school will be contingent upon the number of faculty members and the condition of buildings and equipment. In some instances, a rather wide offering of variables might be possible; in others, very few, if any, should be offered; but, as said above, the variables should be secondary in consideration and should be worked out in the light of the community life which the school is serving.

3. *Little Differentiation is Possible in High Schools with Faculties Consisting of from Two to Five Teachers.* Immediately one begins the matter of working out a daily schedule and offering a number of electives, he meets with difficulties when he has a small faculty. It is a commonly accepted fact in secondary education that the larger the faculty the more variables or electives it is possible for the school to offer.

4. *The Earlier Years of the High-School Curriculum Should Be Liberal and General in Nature and Closely Related to Contemporary Life, Thus Affording a Broad Range of Educational Experiences to All, and Especially to Those Who Drop Out Before Graduation.* Ferris says: "To give a pupil at the beginning of his secondary-school career a broad range of educational experiences closely related to contemporary life is probably to give him the maximum in the way of liberal training, particularly if he leaves school early." In following out this principle of administration, the first two years of the high-school curriculum are largely fixed. During these two years it is the purpose of the school to stress the more common elements of education and to orientate the student as far as possible to modern civilization. The training should consist of courses in general science or biology, worked out on a life basis to give the proper scientific outlook. In order to give the greatest amount of social and civic training, emphasis in the social studies falls upon civics and the various phases of American and modern European history. The social studies embrace, during this period, usually projects in civics, history, geography, and other studies included in the general field of the social sciences. During the third and fourth years of the curriculum, electives should be more common, allowing for differentiation under guidance and providing for the training of special aptitudes and abilities.

5. *In Rural Communities Where a Second and a Third Curriculum Can Be Offered, They Should Be Home Economics and Agriculture,*

in the Order Mentioned. In the small communities where only one curriculum is offered, the variables usually are offered in these two departments; but when facilities justify additional curricula, these are the ones that would render the greatest service in the rural high school.

6. *A Core Curriculum Should Be Followed When More Than One Curriculum Is Possible.* By "core curriculum" the writer does not mean the subjects like English, civics, science, etc., that should be constants in every curriculum; but a grouping of those subjects which, if pursued under proper organization, would determine the peculiar character and function of said curriculum. For example, the core of a home economics curriculum would be courses in cooking, sewing, household decoration, etc.

7. *College Preparation Should Be a Secondary Function, or at Most Only One of the Several Functions, of Any High School.* There was a time in the history of secondary education when the primary and only purpose of a secondary school was the preparation for college entrance. So firm a hold did this matter get upon the thinking of educators that to many it is still its dominant purpose.

8. *There Is a Distinct Difference Between a General or Liberal Education, as Discussed in This Paper, and the Traditional Classical Education of the Past.* It is pretty well agreed among school men that the education of the traditional classical high school was rather worthless for most students of the rural high school. That institution emphasized languages and mathematics all through the four years of high school. Ancient, medieval, and English history usually comprised the studies offered in the field of social sciences; and the small amount of natural science offered was on a logical basis rather than on a life basis, and was in reality a vest-pocket edition of college courses. Such a procedure prevented anything of much importance being done in the way of guidance, of meeting the needs of the majority in the group, or of adapting the work in any way to the varying capacities and interests of the pupils.

NOT THE TRADITIONAL CLASSICAL CURRICULUM

The writer wishes to make himself perfectly clear on one point, and that is that the general, liberal high-school curriculum which he is advocating for the rural high school is not to be confused with the traditional, classical high-school curriculum so prevalent now among high schools of the country. The liberal high-school curriculum has as its fundamental purpose the task of giving to every high-school student the proper outlook upon life as it exists today. It tries to

orientate him socially, morally, intellectually, spiritually, and physically so that he can take his place in modern civilization as a helpful unit in present-day society. It does not in any way exclude the classical or traditional elements in education; it merely reduces them to their proper places in the whole scheme of high-school training. Again, it does not suppose that every boy and girl in the rural high school will go to college, and consequently offer only a college preparatory training. On the other hand, it does assume that it is the right and the heritage of every high-school pupil to go to college if he so desires, and consequently it takes care of him along with those of the other varying groups. In the third place, it assumes that a certain vocational training of a general nature, with the proper insight into the big occupational and vocational work of the world, is a legitimate part of every child's high-school education. It assumes that a certain amount of vocational insight is a part of the orientation work of every adolescent. It does not, however, advocate that extreme attention be given to so-called "vocational subjects" at the expense of the general education simply because the pupils happen to live in the rural districts. The writer takes the position that, more and more, we will have to assume that increasing numbers of children from the rural districts will become citizens later in the towns and cities. He assumes that the cityward drift of the rural population is to be expected and will be continued in the future. He bases this statement on the fact that scientific agriculture, together with modern invention of every description, is every day increasing the productive power of men and is consequently making it possible for fewer people to be engaged in agricultural pursuits. This tendency is so strong that it will increase in the future even after the increase in population is taken into consideration. Stated another way, it means that we will have to continue to expect large numbers of the rural boys and girls to move into the city, and it would not be fair to limit them to a strictly agricultural curriculum.

The rural high school of necessity will continue to be small, and because of this fact it will only be able to offer one curriculum with few variables.

In the light of the foregoing discussion, this curriculum must be of such a nature as to result in a liberal, cultural training—one that would orientate the student to contemporary life.

PERHAPS A JUNIOR HIGH SCHOOL IS BEST

Since this type of training is especially adapted to the first two years of high school, the junior-high-school movement is perhaps the

solution to the problem. It would be possible for almost any rural community to maintain a junior high school of three years. By proper organization, a consolidated central senior high school could be located so as to care for the graduates of a large number of junior high schools in the surrounding communities. Such an organization would allow the junior high schools to do the work in orientation courses, broadening and finding courses, and other courses of a general nature. The senior high school could offer several core curricula designed for the purpose of giving special training, in which these junior-high-school graduates could find work best suited to their varying interests, needs, and capacities.

THE VOCABULARY OF FIRST READERS

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In 1922 a study of the vocabularies of beginning books of twelve reading series was made by Erich Selke and G. A. Selke.[1] The beginning readers or primers analyzed in this study were:

Rational Method of Reading
Progressive Road to Reading
Beacon
Riverside
Gordon
Merrill
Aldine
Edson-Laing
Lippincott
Reading Literature
Natural Reader
Winston

This study revealed that the child who read these twelve beginning books would meet 1,636 different words. And of these 1,636 different words, 783 occurred in only one book. Still more surprising is the fact that these twelve books had but 38 words in common.

With such a wide vocabulary employed, little wonder it is that children meet with serious difficulty in changing from one book to another. Some school systems have met this difficulty, in a way at least, by selecting a certain set of readers and using that particular set throughout the grades. From the vocabulary standpoint this procedure seems to solve the problem, but the reading program of today recommends a wide range of reading material. So the school that some years ago had one "adopted" text, to-day provides a number of readers available to the child. With this extensive reading program at hand, one wonders what the vocabulary problem is in the beginning readers that

[1]Selke, Erich, and Selke, G. A.: "A Study of the Vocabularies of Beginning Books of Twelve Reading Methods." *Elementary School Journal*, Vol. XXII., pp. 745-749.

are appearing on the market today and how it compares with those books published before 1922.

In 1921 the Thorndike word list was made available. Since its appearance, one important selling point of a beginning reader is that its vocabulary has been checked with the Thorndike word list. This statement might give the impression that the readers of today do not present the vocabulary problem of those some few years ago.

With this question in mind, a study, here briefly reported, was undertaken. Eight books, copyrighted in 1926 or 1927, were chosen at random and their vocabularies studied. The following books constituted the group:

Title of Book	Author	Publisher	Date
Child Story	Freeman, Storm, Johnson, French	Lyons and Carnahan	1927
Good Reading	Manly-Griswold	Charles Scribner's Sons	1926
Lincoln	Davidson-Anderson	Laurel Book Company	1926
Playtime	Bryce-Hardy	Newson and Company	1927
Rainbow Fairies	Moore-Wilson	D. C. Heath and Company	1927
The New Primer	Smedley-Olsen	Hall and McCreary Company	1926
Up and Doing	Lucy Gage	Mentzer, Bush and Company	1927
Wag and Puff	Marjorie Hardy	Wheeler Publishing Company	1926

It was found that a child reading these eight books would meet 1,336 different words, of which 706 appeared in only one book and only 42 were common to the eight.

Since the "Selke and Selke" study included twelve books and this study only eight, the results will be more comparable if reduced to percentages.

	Per Cent of Total Vocabulary Appearing in One Book Only	Per Cent of Words Common to All Books
Readers before 1922	.47	.02
Readers of 1926 and 1927	.52	.03

This study has concerned itself with word-form alone. The foregoing figures indicate that the vocabularies of the eight beginning books studied have very little more in common than the books published before 1922.

The following is the list of forty-two words which were found to be common to the eight books:

a	day	like	so
all	do	little	some
am			
an	for	me	that
and		my	the
are	good		they
at		not	time
	have		
be		of	we
but	I	one	what
	in		when
can	is	play	will
come	it		with
		see	
			you
			your

From the following tables conclusions may be drawn in regard to the individual books:

TABLE I

Words Appearing Once

PRIMER	NUMBER OF WORDS APPEARING ONCE	PER CENT APPEARING ONCE
Child Story	54	16.9
Good Reading	195	28.7
Lincoln	80	17.9
Playtime	20	7.1
Rainbow Fairies	15	11.2
The New Primer	29	9.6
Up and Doing	143	33.3
Wag and Puff	73	16.7

TABLE II

The Number of Words in Common

	GOOD READING	LINCOLN	PLAYTIME	RAINBOW FAIRIES	THE NEW PRIMER	UP AND DOING	WAG AND PUFF
Child Story	205	182	130	67	134	144	170
Good Reading	------	273	195	102	202	225	262
Lincoln	------	------	172	82	184	178	227
Playtime	------	------	------	72	137	139	154
Rainbow Fairies	------	------	------	------	72	75	73
The New Primer	------	------	------	------	------	151	165
Up and Doing	------	------	------	------	------	------	171
Wag and Puff	------	------	------	------	------	------	------

TABLE III

The Per Cent of Words in Common

	Child Story	Good Reading	Lincoln	Playtime	Rainbow Fairies	The New Primer	Up and Doing	Wag and Puff
Child Story	------	64.2	57.4	40.8	21.0	42.0	45.4	53.3
Good Reading	30.1	------	40.0	28.6	14.9	29.7	32.9	38.4
Lincoln	40.8	61.2	------	38.6	18.4	41.3	39.8	50.9
Playtime	46.4	69.6	61.4	------	25.7	48.9	49.6	55.0
Rainbow Fairies	50.0	76.1	61.2	53.7	------	53.7	55.9	54.5
The New Primer	44.2	66.7	60.7	45.2	23.4	------	49.8	54.4
Up and Doing	33.6	52.4	41.5	32.4	17.5	35.2	------	39.9
Wag and Puff	38.9	60.1	52.1	35.3	16.7	37.8	39.2	------

This table should be read that *Child Story* contains 30.1 per cent of the vocabulary of *Good Reading*, 40.8 per cent of the vocabulary of the *Lincoln* primer.

THE CONTENT OF SCHOOL ENGLISH[1]

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THE OBJECTIVES OF HIGH-SCHOOL ENGLISH

English a Social Subject

English is the vernacular of America, the established language of daily intercourse throughout the nation. Practically every child hears it in his home from his babyhood onward; every individual employs it every day throughout his life. English is, therefore, not a peculiar property of the school, to be inculcated nowhere else. Life itself teaches language every day. The school, instead of chiefly originating materials, for the most part supplements and refines what has been, after a fashion, learned outside.

Because this is true, English as a school subject depends regarding its content more than does any other school subject on the cultural attainments of each community in which it is to be taught. Furthermore, in its bearing on individual young people, it is conditioned by the cultural attainments of each home. Communities made up of homes differing widely in culture need both an English curriculum content and a technique of teaching flexible and varied enough to bear on the children coming from all homes, leaving no child unprofitably instructed in school because of a great gap, which he cannot bridge, between the degree of literary culture gained from his home and the instruction that the school proffers.

The Goals of School English

The aim of school English is to develop in each young person, supplementing what the home and the community have given him: (1) the ability to *speak* readily and accurately in conversation and perhaps also in various forms of oral public address; (2) the ability to *write* readily and accurately the communications and other written productions that are appropriate to his contacts with the world round about him; (3) the attainment of effective physical and mental habits of *reading*, both for information, for the various purposes of

[1] A paper read at the convention of the Association of Colleges and Secondary Schools of the Southern States, Fort Worth, Texas, December 6, 1928, as a preliminary report from the Committee on High School English Content.

business and social life, and for personal pleasure, refinement, and self-development as a lifelong leisure-time occupation; (4) the ability to *audit* conversation or other spoken language, in order to enjoy it and to assimilate its ideas; (5) the possession of some organized, usable knowledge of essential facts regarding the nature and structure of the English language—facts which reënforce efficient habits of usage and serve to give one the ability to analyze and therefore better criticize and enjoy both one's own use of language and the language usage of other speakers or writers; (6) the possession of a considerable amount of knowledge about established writers and their writings; (7) enjoyment and, if attainable, appreciation of literary excellence; and (8) some familiarity, to serve as a guide to further reading, with a rather wide range of current newspapers, periodicals, and works of reference. It would be possible, by a somewhat less specific classification, to reduce these eight goals to six in number; and six, rather than eight, fields of English should be set forth in the body of a curriculum.

English Is a Continuous Subject

The foregoing objectives of school English are not the goals of high-school English only. They are aimed at in the elementary school and also in the college. The actual attaining of some of them is not achieved by many individual students before maturity; not even the college instills them fully. The undertaking of the high school is to continue the development of each individual from the point at which the elementary school left him and to push the development forward as far as possible. Some individuals will be graduated into college, others into the realm of nonscholastic adult life. After the high school, the college or the nonscholastic world will continue the development, beginning with each individual just where the high school left off.

Probably at no point in the entire range of schooling will any two individual students be quite equal in their attainments. And in spite of the best grading the schools can effect, there will be, at any point in the range, great differences in ability which the teacher must contend with. Each student must be taught. Wherever he stands, in development, the school must go, to lay hold of him and from there lead him onward. A curriculum is a general guide, not a Procrustean bed on which all the students of a school grade are forced to lie, whether they fit it or not. The skillful teacher will always realize that, without departing far or permanently from the general guide, it is possible to turn aside for the benefit of those who are best helped by variation.

No One Phase Can Be Quite Completed

In general, pupils should come from the elementary school having attained a good deal of proficiency in all the phases of school English. It is not to be expected that they will have mastered completely any one phase. Their immaturity conditions them. As they advance toward maturity, they will grow into a grasp of the various aspects and meanings of life itself. It should not be expected that certain curriculum materials can be presented to young people once and for all at any one time and in any one grade of the school, so that they will for ever after be held in mind and will become fixed in habits that require no further encouragement from teachers. The curriculum and the instruction based on it must be cumulative. In each school grade there should be noticing, bringing together, and drilling on facts and habits which were stressed in the earlier grades. The major objective of the truly efficient school is that each pupil enrolled shall be steadily and continuously developed, not that stated curriculum materials shall be presented in stated grades, whether the pupils are ready for them or not, and thereafter neglected in school on the assumption that they were once taught, or at any rate should have been taught, and therefore are not the concern of later teachers. If the pupil, at any stage of his schooling, does not have certain abilities which the curriculum states as desirable, this fact is the immediate concern of every teacher who deals with him until ultimately the desired abilities are securely fixed in his growing self. The high school may expect from the elementary school certain contributions to each pupil. An effort should be made, in a curriculum, to state these specifically. If, however, the high school does not find them inculcated in any particular pupil whom it receives, it must itself begin with such a pupil at the point which he has actually reached, not the point which theoretically he should have reached but actually did not.

The College Should Not Be Overburdened

Precisely the same relationship exists between the high school and the college. Regarding every young person instructed, education must be continuous. The college must take him where the high school leaves him; otherwise there will be a gap in his development which will never be bridged. Because of his increasing general maturity, the college has opportunities for developing in him, in the field of language and literature, degrees of accomplishment that the lower schools cannot give, because he is not far enough advanced in self-realization and self-mastery to receive them in these earlier years. Owing to this great opportunity offered the college, it is highly desir-

able that the high school shall not leave for it to do the heavy work of instilling attitudes, habits, and knowledge which could just as well, in an efficient school system, have been inculcated earlier. The burden of obligation for these justly rests on the high school and the elementary school.

The High School Should Finish Its Task

For another reason also it is very desirable that the high school should not regularly leave for future education to accomplish any of the things which are really essential in efficient living. Many young people do not go on to college. What the high school gives them is their final school training. What it omits to instill they may never learn, or, if they do, will gain not through kindly school methods and consideration, but through brutal handling by the business and social world of adults. The high school should regard itself as a finishing school. It should round out and complete its educational undertakings, not assume (although this will often happen) that a higher schooling is to follow.

College Entrance Exacts No Peculiar Attainments

The same training in English that prepares a youth for efficient living in the world of adults will train him equally well for entrance into college. The latter requires, essentially, no specific new materials, although for convenience, for general guidance, and for the purposes of standardization specific curriculum materials to be mastered in high school may happen to be stated as college-entrance requirements. It is essentially sufficient for at least the beginning of success in college that a youth be able to speak and write so as to express ideas adequately, without glaring faults of accuracy of statement, of organization of ideas, or of conventional or organic language form, and that he shall have read a good deal, including some universally known literature, and shall have established efficient physical and mental habits of reading. In essence, whatever may happen to be published as "requirements," probably no college really intends to demand more of its beginning students than these qualities, or is satisfied with substitutions for them. If the high school does well the work expected of it as an efficient social-service institution, it will have no particular problem, in general, regarding college-entrance preparation.

Shall the College Repeat Earlier Teaching?

In college English, however, the tasks belonging mainly to the high school or even to the elementary school may not be considered done

and therefore be altogether neglected. Even well-established habits must be kept continuously in practice, or they will be lost. Reviews will always be necessary. Furthermore, the increased maturity of the students permits them now to see old materials in a new light; what seems to be repetition is not really so. The same curriculum materials which were presented in elementary school and again in high school may be reëxamined in college. The materials are the same, but because the young people have themselves acquired a greater degree of maturity, now having a larger horizon in life and a more accurate perception of their personal needs and of general social values, there will be not really repetition, in a true sense, but the presenting of old materials to new persons, who now for perhaps the first time can really perceive the values inherent in them.

The Essence of Reviews

When old materials are re-presented, however, it is a principle of good teaching that they shall be adjusted in appeal and applicability to the new, high level which the students addressed have recently attained. If the old materials are merely dealt out on the old level, the young people will be quickly wearied, will consequently give them little attention, and will not grasp them in the new meaning which more skillful teaching would have put foremost. This statement is true not only of repetitions of material in coördinating high school and college, but also in the relations of high school to elementary school and even in the repetitions given in the various years of the high school itself.

Reviewing the Facts of Language

The particular bearing of this principle on the facts of language should perhaps especially be pointed out. It is indisputably true that a general, organized, scientific survey of the facts of the English language is not very significant to undeveloped children, yet is, on the other hand, valuable and interesting to a cultured, highly developed adult. If it is presented to young pupils, experience shows us that the time is rather unprofitably spent. Toward the beginning of his development an individual can be taught most profitably by a use of the concrete, by practice in doing ever better the actions which belong naturally to his sphere of life at the stage of growth he has then reached. Practice accompanied by constant criticism and encouragement, but criticism which does not attempt too great generalization and abstraction, is the best procedure for developing young people toward a mastery of the use of language. And as they grow, this practice must be continued, though always expanding, of course,

to set them to work anew at an ever higher level of personal experience and capacity. Nevertheless, even from the first of a child's schooling, facts of language—sheer knowledge—must be inculcated. He can at first make little of them, not because they themselves are not of great significance and of widespread bearing, but because he as yet has little to put into them. But as he grows, if the repetitions and the new materials of the kind are skillfully presented so as to strike his newly attained level, the materials will take on a growing significance. On the other hand, if facts of language are merely drilled upon, kept ever at the same level of appeal, the pupil will soon be wearied, will soon cease to give them his interested attention, and will spend unprofitably the school time devoted to an effort to instill them. Through the elementary school, through the high school, and through the college the instilling of facts about the English language should continue; but it will be largely a waste of time unless it begins sparingly and simply and attempts a highly organized, systematic survey only when the students are well advanced toward adulthood.

Language Is Mastered Only Late

The college is mistaken if it expects a mastery of the facts of language to be "a closed book" in the development of the young people it receives from the high school. Mastery of language is attained late, rather than early. It should be sought as a major objective of the college, not relegated to an inferior place and overshadowed by the study of literature. Even the elimination of errors of spoken and written form cannot well be altogether completed, though of course it must be dealt with earnestly, by instruction in the high school. A portion of this undertaking is conditioned by the students' general immaturity, and cannot be completed, as a rule, within the high-school years. This statement requires specific expansion, which should be given in the body of a curriculum; it must not be taken as justifying inadequacy in the high school in the elimination of errors which can well be done away with there.

English a Constructive Subject

A final topic in the statement of the objectives of instruction in English is that the subject should be essentially constructive, not merely corrective.

Yet Correction Is In Its Essence

In the very nature of English as a social subject, however, lies the task of incorporating in it a great deal of correction. Young people speak and write English more outside the school than in it; they

hear their parents, their families, their friends, their neighbors, and other persons whom perhaps they admire and are influenced by use the vernacular for the ordinary purposes of life. Often their standards are determined by this usage of English out of school much more than by what teachers and school textbooks tell them and perhaps require them to practice within the walls of the schoolroom. The influence of the environment is not likely to be toward conventionally and structurally correct language, though it will be toward at least crude efficiency in the employment of language for social communication. Consequently teachers of English will often come to consider their chief work to be the destruction, often by severe methods, of wrong linguistic habits.

Similarly a taste for pitifully inferior literature, or perhaps a habit of doing no reading at all, will be established in children through the influence of family or community. And the task of the school will seem to many teachers to be the uprooting of these notions rather than essentially the building of new and better tastes and habits.

Merely Tearing Down Is Ineffective Teaching

No school subject can be very successful that consists chiefly in finding fault. People, young or old, do not enjoy having fault found with them—at least, not day in and day out. They shrink from the occasion which causes it; they protect themselves as well as they can. If they can run away or stay away—that is, if physical absence can actually be brought about—they will resort to this. But if this protection cannot be had, it is quite possible for most human beings to be, under compulsion, physically present at the place of persistent nagging and faultfinding, and yet in mind and spirit far, far away. So it is with children and the school which mainly finds fault. The flaws it sees may be there—indeed, probably are there; but its prevailing attitude largely defeats its efforts to teach. It is often a shock to good teachers of English to hear (perhaps overhear) students not their own denounce English roundly as the least profitable and the least liked subject in the school. Perhaps on most such occasions, if the truth could be learned, the subject is being taught destructively. No teaching can be, according to modern standards, admirable and successful which does not enlist the coöperation of the students; and this coöperation cannot be had by a program which consists chiefly of finding fault.

The curriculum of English should be constructive. Although this subject more than any other taught in school has to make its way against wrong attitudes and habits implanted by the low standards of

commonplace society, yet if it persistently and attractively builds better attitudes and habits it will ultimately starve out these others. The best will prevail, and the inferior will be starved out incidentally. The curriculum of high-school English should, therefore, not be stated chiefly, nor the practice of teaching be conducted chiefly, in terms of faults to be eradicated.

Arbitrariness Is Destructive

One phase of constructiveness in teaching English consists of being less arbitrary than teachers and curricula of English have sometimes been wont to be regarding debatable matters of language and matters of literary criticism. The knowledge and the judgment of young people will often be wrong, but they are not always wrong, not even when they differ from the statements made by some "authority" in a book. A thoughtful, honest bit of usage or of criticism should often be accepted, even if not conventional. The pupil may change his mind later, or perhaps his insight is good, and he may be right. Both language and literature are alive; they are constantly changing. Many narrow, arbitrary statements about them are in print, but often these are being superseded by the progressive thought of liberal men and women of culture, and some few never were true, but are the unfounded opinions of arbitrary writers. Much faultfinding in English classes does not point out real faults at all, but is dictated by whims or by differences in taste. A more constructive attitude would have passed it by, at least for the time being. Pupils would have grown more if they had been encouraged to be venturesome.

WHAT A CURRICULUM CONTAINS

The curriculum of English should state the materials which, in each school grade, should be studied, used, and criticized by the pupils to promote their wholesome development. It should, further, suggest to teachers how these materials may best be presented and employed for educational purposes. It should, thirdly, state clearly both for the teachers and for the pupils the goals to be aimed at, not only in each phase of English in general, but also in each phase of English in each school grade. Fourthly, it should provide for variations from the norm, both so that the curriculum as a whole can be adapted to schools of many different kinds and sizes and in various communities and so that, in any one school, each pupil may receive the instruction and stimulus he personally needs to supplement what English he already has, even if no other pupil needs precisely the same things. Fifthly, the curriculum should provide or suggest tests and examina-

tions which will serve to standardize the product of high schools and the schools themselves, yet will not stultify either pupils or schools and will not force upon communities types of schools not best suited to them.

WHAT ENGLISH IS—A SOCIAL TOOL SUBJECT

English as a school subject should, in the light of modern education, be defined as an instrument of social intercommunication. The schools serve the public welfare. It is their task and high privilege to develop the young people of the nation to the highest plane of personal worth each has it in him to reach during the years of his immaturity and to pass them on into adulthood well equipped for the responsibilities of productive life. This is the service of public education to the individual. To no child in America is this service denied. From the point of view strictly of government and national well-being, the schools develop all young people toward wise, thoughtful citizenship—participation in the deliberations which determine national welfare. In both the private and the public aspects of education, English, the subject which leads to a mastery of exchange of ideas, is the most critical in the school. It is paramount in importance. It is the dominant school subject, receiving in all grades of school and college more program time and being set forward more firmly as an unescapable requirement for all students than any other school subject.

There are other definitions of English, some of them very narrow; but the elementary school and high school at least, and probably the college also, ought to brush them all aside. If English is only a narrow subject—such as, for instance, a study of formal grammar plus a study of selected literary classics—it has no right, in a crowded general school curriculum, to as much emphasis and program time as it now receives.

A Dynamic Subject

Free, accurate communication of one person with another lies at the heart of private and public efficiency. English is the school subject which is responsible for developing this art. It is a dynamic art, a thing of action and of use, not mainly a storing up of memorized facts. The proof of mastery of English is what it can *do*, its capacity for effecting desired accomplishment.

Six Fields

English, the mastery of communication between persons by means of words, comprises four fields of activity and two of accurate, organized knowledge underlying the activities. In other words, it is both an art and a science—an art in four fields and a science in two, grasp-

ing and organizing the fundamentals basic to all four fields of linguistic art. The four fields of activity are speech, writing, reading, and listening, or auditing—the receiving and assimilating of the spoken word. The first of the two fields of science is a knowledge of language—the various phases of which deal with facts involved in speech, writing, reading, and auditing, and also with the nature and history of the English language, detached from problems of immediate use. The second of the fields of science comprises knowledge of literature, its authors, and its essential qualities.

English a Wide and Pervasive Subject

English, in the conception here presented, is a very wide subject—in fact, in some aspects an all-embracing subject; for in the school English has not only a field of its own, but also, because it deals with the tool used for nearly all communications of ideas, a pervasive relationship with all other subjects. Probably no one can tell where English, in this sense, leaves off. One of the perennial, unsolved problems of the school world is: How should English be taught, or at least safeguarded, in the school classes in other subjects?

In this wide sense English is everywhere in the school, touching all expression uttered by means of words. Indeed, certain educators, noticing this fact, have in the past suggested that it be abolished as a separate subject and instead be taught systematically as a part of all subjects. The flaw in this plan is that it neglects English as a particular, not a general, field; there are many topics in the subject as it stands that would be presented nowhere if English were placed altogether in an incidental position.

English Not Literary Only

The fact is to be carefully noted that English is, in the current-day conception, not limited to be merely a literary study. There was a time when it was chiefly, if not altogether, literary, both in the reading and in the writing it expected of students. The present social-service conception has, however, without crowding out established literature—"masterpieces," or even, altogether, student writings with great literary pretensions—the "themes" of bygone days, brought in a wealth of new English materials of non-literary sorts. Nowadays the study of literary classics constitutes only a portion of the reading done. Reading for information is solidly established, in various aspects. Speech, almost wholly unliterary, has been introduced and is now steadily growing in educational effectiveness, some phases be-

ing among the most popular and, possibly, the most productive activities of the school.

The writings expected of students are also becoming increasingly non-literary in character and more and more the kind that people commonly use in written communications with each other. The entire subject has undergone, and is undergoing, a transition. This is occurring, however, without seriously sacrificing literary values which in the past were really found educationally profitable.

Colloquial Language Is Approved

There is a transition occurring also in the attitude toward language. It is not only that, in the spirit of modern education, the *use* of language is being emphasized, but also that the ever-changing and developing English speech is being viewed more progressively. A living language is always changing. Individuals, or the schools, at any given time, may vary in attitude toward this change, from extreme conservatism to extreme radicalism or to any stages in between. The school curriculum of the present is not radical, but is less conservative toward changes in "good English" than it was once. In general, a more colloquial vernacular than formerly is being taught. Young people are learning that the school approves, not only of formal literary language, as formerly, but also of colloquial speech such as one careful, accurate adult would use informally to another. The schools are coming nearer to the people. The English of the schoolroom is much less stilted than it was.

Standards Broadened, But Not Lowered

The changes stated do not imply, as some conservatives might fear, a lowering of standards. They embody a broadening of the school undertaking, but not a lowering of its ambitions and accomplishments. This may be stated in other words as follows: The student population of schools and colleges, being inclusive now of the children of the whole American nation, is more diverse in type and in family and community background than ever before. Some students are of the types that formerly went through high school and college, but many are not. The course of study and the art of teaching have been broadened so as to include facilities to develop these types of young people formerly not dealt with. At the same time, facilities to care for individual differences in students are being seriously and thoughtfully devised. Students typical of the former population of schools and colleges now receive fully as good and about as much instruction in the comparatively narrow fields which formerly were the only

ones offered as they ever would have received. But a much wider range of subject matter and teaching is also brought to bear upon them, from which they receive added benefit. This new wide range is not inferior, except in traditional standing; it calls forth the best abilities young people have. It appeals, however, also to types of students formerly not in attendance. It is, in general, without being utilitarian in a bad sense, of much more direct and immediate social usefulness than the former materials and teaching in the schools. No student, whether he belong to the older type or the newer, receives less than the full degree of development he has it in him to take.

THE STRUCTURAL DIVISIONS OF A COURSE OF STUDY IN ENGLISH

From the beginning of the elementary school to the end of the college, a stretch of some sixteen years in young people's development, six structural divisions of English should be continuously extended.

All six should be, to at least some degree, bearing on each pupil throughout these critical sixteen years of his growth. Probably, however, they are not of equal importance, either to any individual pupil at a particular stage of his development or to linguistic education in general. In program time they should not be allotted the same number of hours. But the proportions of this allotment will vary, in the different school grades, and in the course of the sixteen of these perhaps every one of the six structural phases of English will at some time receive the major emphasis.

SIX PARALLEL, INTERRELATED, SUBDIVIDED COURSES

The six main structural divisions of English are themselves variously subdivided. The specific types of undertaking comprised in each and the detailed curriculum materials included in each such type should be stated in the body of a course of study.

These six continuous divisions of school English, which are to be incorporated into each stage of education, are as follows:

(1) The development of a skillful employment of Spoken English;

(2) The development of a skillful employment of Written English;

(3) The development of effective habits, attitudes, and tastes in Reading;

(4) The development of socially valuable habits and attitudes in Auditing the spoken words of others;

(5) The building up of a dependable, well-organized body of Knowledge of the essential facts about the nature and structure of the English language;

(6) The building up of a dependable, well-organized body of Knowledge of valuable facts, which will serve one well in adulthood, about established literature and its authors and about the books and periodicals which are available for reading in order to obtain information.

ASSEMBLING SPECIFIC MATERIALS IN EACH STRUCTURAL LINE

After the structural lines of a school course in English have been determined, the next step is to assemble the manifold materials available for educational purposes in each structural line of the course and to plan in detail the study and other activities which pupils will perform in connection with these. This is the body of details constituting the curriculum. In bulk it is by far the greatest portion. And it, not the general principles, is the part of the curriculum which, at any one time, bears directly upon the pupils.

The present paper does not discuss these specific materials. Assembling them is not altogether easy; it is conditioned by various factors of time, worth, attractiveness, and feasibility. There is, however, a vast store to choose from, for teachers and textbook makers have, in the past, devised an almost limitless wealth of specific things to learn and things to do, and inventiveness is still rife. Furthermore, many materials have been well tested by time and repeated and various usage.

Filling in the details is distinctly subordinate to establishing the main outlines of a curriculum. Unless the latter great task is first satisfactorily done, the assembly of specific materials, however attractive these may be in themselves, will fail, in the large, in educational effectiveness. The present undertaking is to establish general lines of endeavor in school English rather than to complete a course of study, including the assembling and fitting of all the necessary particular items into the outline, so as to exhibit an expansive, immediately usable curriculum. This latter task follows logically as another undertaking.

THE GRADING OF A COURSE IN ENGLISH

When the structural lines have been set up and a great store of specific materials fitting into these have been brought together, curriculum making proceeds next to distribute into the various school grades, and into portions of the school year in each grade, the particular materials which have been assembled in each of the parallel structural divisions of the course of study.

Sometimes, indeed, there is interrelationship between these parallel

divisions. Certain knowledges and activities will serve more broadly than in one line only. Nevertheless, in planning the course, the various large endeavors must be kept in mind separately. Otherwise the requisite progression in each might be neglected.

The Psychology of Youth—Social Values

Various principles operate in the grading of materials. There must be, in the first place, a careful adjustment to the known facts in the psychology and the other basal characteristics of youth at different stages of growth. Materials are often ineffective in school, not because they are not in themselves good, but because they are placed in the wrong school grades. Secondly, there must be attention to the social usefulness and value of various materials. Not all curriculum materials are of equal value. In general, the distribution should be so arranged that every child will receive each year and half year a development in all the six structural lines of school English which will make him then and there the best individual and citizen he can become at that stage of his growth. Teaching should aim at the future, but as far as possible should not aim at the future only, but also at the present. The best education is had from a child's being an active, efficient participator in life from day to day and year to year as he grows up. Personal worth and valuable citizenship are not things of a far-off future, but of each day and year. This requires much careful analysis, in curriculum making, so as to build consistently and continuously in social values.

Repetition and Drill

The repetition of material must be carefully worked out. There are several phases of this problem. One is the determining of what materials are worth repetition; a related one is the ascertaining of how much repetition need be given each item; another is the placing of repetition advantageously, not only with reference to the choice of school grades, but also in regard to the environing materials in the vicinity of which it is set, so that there will not be monotony, with a consequent lack of interest and attention. A further phase, hardly less perplexing than the others, is the providing of optional drill materials, to be used not by all pupils but only by those who need them.

CURRICULUM MAKING IS CONTINUOUS

An attempt to discuss grading exhaustively is not made here. There are other factors entering in. In the last analysis, any curriculum must, with reference to its grading, be put forward tentatively and

subject to experimental verification and readjustment. A rather arbitrary beginning can be made, but this first form should not be expected to stand as a bulwark resisting change in the light of the experience of teachers.

In fact, there ought to be, in a governing organization, a continuous committee on curriculum, whose reports, based on the careful collecting of the results of teaching, would modify any curriculum from time to time. To this committee any school or any teacher might freely report. Not only in English, but also in all school subjects, any arbitrarily fixed curriculum will soon become, if it is not at first, ill suited to the schools. For a society, an adult life, that is as rapidly and continuously changing as ours in America, only a changing curriculum can really keep the schools in tune with life.

THE SIZE OF SCHOOL UNITS OF MATERIAL

The best size of school units of material can be determined only by long-continued experimentation in many different types of schools. Unfortunately, the views now prevalent are mostly unsupported by reliable facts.

A Large-Topic Basis

It seems probable that curriculum material should be presented to pupils in portions that will, in general, conform to a large-topic plan, rather than require learning a multitude of facts one by one. This does not indicate, however, that there should never be a learning of facts one by one separately and never any "recitations" in the schoolroom. Probably there is a place for both kinds of presentation. Nor does the plan necessarily indicate that the organization should be limited only to large topics, or any one such, of the trade-marked, much-promoted specific sorts. There may be other kinds.

Topics of Moderate Length

The large topic should not be extended to a length of time that will weary students. The small topic should not be choppy and without a carry-over of interest from day to day. These points are imperative, in the statement of the curriculum and in its administration. Whatever plans are used should keep all the pupils busy—fully and profitably occupied all the time; no plan is good which permits loafing by excellent students, or which goes "over the heads" of poor or handicapped students and in essence consequently makes loafers of them. That is, a plan must be adjustable to individuals. Furthermore, it must be adjustable to different types of schools and communities.

Tentatively, it seems best to say that, in high-school English, most of the curriculum should be framed in separate large topics which will set pupils to work on a continuous study or series of activities that will occupy two or three weeks of school time—that is, about ten or fifteen days. Few topics should be longer; some should be much shorter.

The plan of program, now somewhat prevalent, which makes class study on different phases of English be arranged by days of the week is to be discouraged. It is hopelessly choppy, with no carry-over of interest, activity, and growth from day to day. In like manner, however, the other extreme should be done away with—the plan of allotting to the study of one topic (say, one English classics, such as *Ivanhoe* or *Macbeth*) several months or an entire half year. The two plans, save perhaps in exceptional circumstances, are notably undesirable.

Variation From a Curriculum Is Permissible

Whatever the length of topics and whatever the main organization of these regarding the time supposed to be spent, there should be flexibility provided. No school and no teacher should be required by a course of study to spend on certain materials more time than is actually profitable to the particular pupils being taught. If this is done, clearly something is wrong. What a curriculum states should be the norm; any departure from this is, by virtue of that fact, accepting the responsibility of justifying itself. It is on the defensive, but is not to be prohibited altogether.

An adequate course of study in high-school English should provide alternatives. Some of the topics are inescapable, but others are not. A distinction should be made, determined on broad grounds, certainly not on prejudices. When a particular group of pupils can be best served by substituting a provided alternative for the topic regularly given, the substitution should be made. Similarly, schools should be permitted to serve their particular communities rather than to conform to a fixed topic, provided that the materials left out are not in themselves essential and therefore not subject to substitution.

It is a truism to state that no materials are subject to substitution merely because they are, to the teacher, "hard to teach," or because they require from the teacher a greater amount of labor than would some other topic.

Substitution should be carefully planned in the general curriculum; it should not be permitted at random according to the whim of particular teachers or schools, bringing in materials not stated in the general curriculum.

STANDARDIZATION BY MEANS OF TESTS, EXAMINATIONS, AND MEASUREMENTS

It is desirable to standardize high-school English to a reasonable extent. The topics of a curriculum should be presented to all pupils with somewhat the same degree of skill and consequent productiveness. Otherwise a "high school" might be such only in name.

English is, however, a difficult subject to standardize by means of the tests and measurements we have as yet been able to devise; and the possibilities of great productiveness of the subject in the development of young people should, of course, not be restricted by any inadequacies in our testing system. In general, the items of knowledge can be tested fairly well by our present standard examinations, but not the parallel items of habits, attitudes, and appreciations. Tests are constantly being improved and expanded to cover the more subtle fields of learning and development. These should be welcomed and freely used experimentally.

It would, however, be very undesirable to restrict English to endeavors which, it happens, can now be tested by existing examinations. In some schools this has actually occurred, just as it has occurred in other subjects. It is a childishly easy way to make a school system "scientific." Education would be greatly handicapped if this short-sighted policy should be followed widely.

As our abilities in testing and supervision now stand, it seems that personal judgment must still largely be relied upon—the judgment of skillful supervisors and inspectors whose horizon in English is broad, not narrow.

A SUMMARY—THE SCHOOL COURSE IN ENGLISH

In summary, it may be said that the school course in English herein recommended consists of six parallel lines or fields which, taken together, constitute English as a school subject. These are continuous throughout the entire school system, not peculiar to the high-school portion alone. In them there are very many particular topics, and among these topics some are much more important for education than others. Important topics are repeated at intervals throughout the sixteen years of schooling available to each pupil, but are each time readjusted to the new general level of development up to which he has grown. The high school stands as a part of a continuous whole, rather than a separate undertaking.

English is presented, in general, as a social activity—a tool for daily use in a world depending for nearly all kinds of success on ability in the exchange of ideas by means of language. It is kept as free

from merely academic content as possible—substance put in for the sake of logical completeness, but really of little or no educational worth. Ideas and materials which are of historic value chiefly are subordinated to those of notable present-day value. Literature and the appreciation of literature are not sacrificed. Ours is not merely, not even primarily, a workaday, humdrum world.

In the programming of English in the different school grades an experimental procedure is suggested as the only final solution. This should be supplemented by a continuously active committee, which will adjust materials to grades as the results of experimentation in many types of school provide greater certainty than we now have. Any arrangement stated in any curriculum is frankly considered to be tentative.

Large topics are preferred, but not too large, and not exclusively.

Variation from the general program set up is definitely contemplated. It should be provided for in detail, not left to the individual teacher to devise.

Standards and minimal essentials for the high school and for each grade within it are advocated. The inadequacy of present tools for measurement is noted, and it is recommended that supervision and inspection by men and women with good judgment and good powers of observation regarding the progress of the educative process cannot be superseded by standard tests until these are developed, in English, far beyond where they now are able to reach.

EDITORIALS

THE NATION'S BIGGEST BUSINESS

The faith of America in education continues undiminished. Every year there are not only more children enrolled in the schools and colleges, but a larger proportion of all the young people of our increasing national population. And the financial investment grows apace.

ITS SIZE AND WHAT IT COSTS

From the June, 1928, Annual Report of the Federal Commissioner of Education we draw the following statistics—the figures, the latest available, being those for the year ending in June, 1926. And there is every indication that those for 1926-7 and 1927-8, when available, will be proportionately greater.

THE SCHOOL STATISTICS OF AMERICA
(1925-1926

ENROLLMENT		
Pupils enrolled in *public* elementary schools, including kindergartens	20,984,002	
Pupils enrolled in *private* elementary schools, including kindergartens	2,143,100	
Total elementary-school enrollment		23,127,102
Pupils enrolled in *public* secondary schools, including junior high schools	3,786,071	
Pupils enrolled in *private* secondary schools, including junior high schools	346,054	
Total secondary-school enrollment		4,132,125
Students enrolled in *public* colleges and universities	280,437	
Students enrolled in *private* colleges and universities	486,704	
Total college and university enrollment		767,141
Students enrolled in *public* teacher-training institutions	252,907	
Students enrolled in *private* teacher-training institutions	17,209	
Total teacher-training enrollment		270,116
Total enrollment in all schools		28,296,484
TEACHERS		
Teachers in service		977,291
Number of teachers in training (as above)		270,116
One teacher in service to every 29 pupils enrolled		
One teacher in training to every 3.6 teachers in service		
FINANCIAL INVESTMENT AND ANNUAL COST		
Present (1925-1926) investment in school property, not including endowments	$7,063,496,430	
Present endowment funds	1,061,589,042	

Total present value of property and endowment, all schools		$8,125,085,472
Total cost of operation and maintenance, all schools, year 1925-1926		2,744,979,689
Operation and maintenance cost *per pupil enrolled*, all schools, year 1925-1926	97.00	
Operation and maintenance cost *per pupil in average daily attendance*, year 1925-1926	102.05	
Present (1925-1926) investment in school property and endowment *per pupil enrolled*	287.14	

WHAT IS IT WORTH?

All America is united in the belief that this enormous cost is not too great—that a careful educational investment in youth is the wisest expenditure we make from our abundant national funds. Yet it behooves us educators to ponder carefully as we administer our trust. The present attitude of the public is idealistic—almost romantic, as we ought to recognize. Scarcely ever are we brought to a sharp, well-considered reckoning of precisely what we give to the nation through the funds so freely granted us. The belief in education is as yet largely a blind faith, an unreasoned impulse. But this is only half the spirit of America; the other half is hard-headed, skeptical, insistent on balancing books carefully under an unrelenting, clear light. We may be quite sure that, sooner or later, we shall have to stand a scrutiny to which we have not yet been subjected.

The schools and all our vaunted notions about conducting them have not yet gone on trial. We say that American education is an "experiment." But when we say so, we treat ourselves and our endeavors leniently, for that is not really an experiment which has not been relentlessly scrutinized. Education is still a romantic adventuring, by our public and by ourselves.

The worth of American education will ultimately be judged by its conformity to a national philosophy of life—a philosophy apparent in vague strivings of our corporate spirit, but not yet clearly formulated. The end-product of the schools must be worthy, in the American conception of worthiness, as an individual, as a participant in society, and as a citizen. And all children, without discard, without a limit put upon opportunity, and without unreasonable constraint of personal liberty, must be brought to the degree of achievement in these respects which is possible to each. Universal citizenship requires universal education—not merely nominal, but real in a sense which, it may be surmised, the schools have not yet grasped.

The American schools have been passing through an era of earnest attempt at accurate measurement. The impulse was good, a striving in the right direction. But we have not gone far. Most of the in-

struments which we hailed with acclaim a few years ago as measuring our achievements definitely we have now learned to distrust. And, in general, it is probably true, what we measured constituted, as a class, largely the superficialities of education rather than its essence. With the tools we now have, things are easy to measure, it seems, almost directly in proportion to their lack of basal significance in the outcome which the schools must ultimately attain. We have perhaps taken our feeble achievements in self-measurement too seriously, and the shock of not finding them very dependable, after all, is great; but we must go forward, not become timid and turn back. If we have done little thus far—much less than we once thought—why, there is more to look forward to in the future! Let us really *know*.

It is not easy to build a school system which will satisfy a national philosophy of life that this great but young nation of ours is itself not yet mature enough to express. We school people are in the difficult position of having a task handed to us the goals of which are not yet formulated. Perhaps we have in our hands in a very real sense the shaping of the nation.

But what a mammoth school system—the wonder of the world!—has grown up in this land of ours in only a few years.

PROGRESS

The method in teaching, the final word on how to teach best, does not exist. To encompass teaching within the limits of any one method is to belittle it. But we school people, although we know this, are amazingly naive at times, nevertheless, and accept the pronouncement of one methodist after another with an enthusiasm which subsequent experience does not justify. True, each method strongly proposed probably has some good in it; and, if it has, that little modicum of good, being stripped of its trappings and superfluities, becomes a part of the permanent treasures of pedagogy. Such has been the history to date of all methods of any renown. The Grube method in Arithmetic, the Project method in general, the various methods in Reading, these and others, have had the day of their furor, have been wildly overpraised and then as unthoughtfully contemned. Ultimately they have made their real contributions, but none of them, after all, was *the method*. In like manner the phrases denoting methods have their reign, leave their contribution, and then yield in favor of newer catchwords and slogans.

Education is a spiritual adventure, and the spirit ranges free. It cannot be confined by man-made formulations, for man at best can see but a part. He cannot, therefore, devise *the* method of teaching anything. But he cannot, must not, stop trying!

APPLICATIONS

Recently a college board was faced with the necessity of electing a president. Its first official act in the matter was to serve notice that no application, direct or indirect, would be considered. Somehow the assumption of all initiative by the board stands as a wholesome example. But if it is a wholesome example, why limit its application? What differentiation in ethics makes it impolite to apply for a presidency and polite to apply for a place in first grade? Physicians cannot, we believe, "apply" to treat the bodies of people, or dentists to treat their teeth, or ministers to direct their spiritual activities. What difference authorizes a girl to "apply" to train a child's mind?

"I ought to land something soon. I have six applications out." "I heard one of the teachers at Blankville is getting married Thanksgiving. I think I'll send in my application." Such statements, casually made, are not satisfactorily infrequent. The most favorable estimate of "applications" does not permit their being made at random. The board which does its own applying is likely to find the best teachers.

It is depressing to find aggressive, assertive applicants for places of honor in educational organizations—state educational associations, and the like. Why the urge? The presidency of a state teachers association, of a departmental organization, of an alumni association, of any body of teachers, should never be considered a stepping stone to anything except to greater achievements. The presidency should never be open to any one who is an active candidate for it or who permits others to invest his candidacy with an unprofessional eagerness. Let only those be eligible who have in long service and crucial tests demonstrated their fitness. And let no one of this kind to whom the call is made refuse.

THE NEW BOOKS ON OUR SHELF

[The reviews, most of them signed, are by appropriate members of the Faculty of GEORGE PEABODY COLLEGE FOR TEACHERS. Our limited space necessitates concise, compact notices, but, we hope, without superficiality.]

Fifty Famous Painters. By HENRIETTA GERWIG. New York: Thomas Y. Crowell Co., 1926. Pp. ix + 416. Price, $3.50.

The leading painters of seven countries are discussed briefly, in about six or eight pages for each article. A short, general summary of the art of a nation introduces each section. Biographical material, rather than a discussion of pictures, is given. Interesting details and old traditional stories concerning the lives of the artists are recounted. Practically every student of art is familiar with most of the information given. The style is readable and simple. There are twelve color plates (which are far from being excellent reproductions) and a number of black and white illustrations. G. S. D.

A Glossary of Three Hundred Terms Used in Educational Measurement and Research. By CHARLES W. ODELL (University of Illinois). Bulletin No. 40, Bureau of Educational Research. Urbana: University of Illinois Press, 1928. Pp. 68. Price, 50 cents.

A valuable glossary for novices in the field, provided that it is not used for cramming.

Three Problem Children. Narratives from the Case Records of a Child Guidance Clinic. New York: Joint Committee on Methods of Preventing Delinquency, 1926. Pp. viii + 142.

A well-written addition to the rapidly growing list of books dealing with individual cases. Such are valuable for the expert, but not for the untrained worker. S. C. G.

High School Chemistry. By GEORGE HOWARD BRUCE. Yonkers, N. Y.: World Book Co., 1928. Pp. x + 550. Price, $1.68.

A rather thoroughly "standardized" text, written by one who has served on the College Entrance Examination Board and who adopts as well the syllabus of the American Chemical Society. A strong text as to formulas and problems. H. A. W.

Psychology for Teachers. By CHARLES E. BENSON, JAMES E. LOUGH, CHARLES E. SKINNER, and PAUL V. WEST (New York University). Boston: Ginn & Co., 1926. Pp. x + 390. Price, $2.

An excellent, well-printed textbook for a first course in psychology. S. C. G.

Standardizing Teachers' Examinations, and the Distribution of Class Marks. By ROBERT S. ELLIS. Bloomington, Ill.: Public School Publishing Co., 1927. Pp. 170. Price, 75 cents.

A rather inferior addition to a growing list of titles, a number of which are contributions to the field. Largely a restatement of methods and principles well presented elsewhere. S. C. G.

The New Human Interest Library. S. E. FARQUHAR, Managing Editor. Chicago: The Midland Press, 1928. 6 volumes.

A children's encyclopedia, arranged by attractive large topics and written in simple, easy-flowing language, chiefly in story form. A valuable addition, it seems to us, to the several existing collections of organized content reading for children of elementary-school age. No literature. Strong, fascinating material on science, the industries, and activities for children. Good biographies—Epoch Makers of History and Great Americans. A 350-page history of the United States and a volume of brief accounts of other peoples. In all, 2,560 pages of interesting, profitable reading, well indexed, well illustrated, and attractively bound, selling at a price amounting to less than two cents a page. Worth having, in home and school. C. S. P.

The Path of Learning. By HENRY W. HOLMES (Harvard University) and BURTON P. FOWLER. Boston: Little, Brown & Co., 1926. Pp. x + 488.

This volume is a collection of twenty-three essays on seven educational topics grouped under the following headings: "Some Conceptions of Education," "Democracy and Public Education," "The Problem of Mental Discipline," "What Shall We Teach?" "Experiments in Progressive Education," "Education for Character," and "The Profession of Teaching." Sixteen of the essays have appeared in the *Atlantic Monthly.* C. W. K.

Fundamentals of Human Motivation. By LEONARD T. TROLAND (Harvard University). New York: D. Van Nostrand Co., Inc., 1928. Pp. xiv + 521. Price, $5.

This is a somewhat technical book, chiefly for psychologists, on a very important topic in modern psychology. The reader who has some degree of acquaintance with developments in present-day psychology, even though not a specialist in this line, will find this book extremely stimulating. The problem of motivation is getting to be an important one in psychology, and the attention it is now receiving in experimental work is sure to yield results valuable to the practical educator. Since the subject is yet largely a new one, the psychologist finds in this book plenty of opportunity for differences with the author on special points, particularly on his "psychical monism." J. P.

School Training for Gifted Children. By HENRY HERBERT GODDARD (Ohio State University). Yonkers, N. Y.: World Book Co., 1928. Pp. xii + 266. Price, $2.

At last we have something more than general theory and statistical treatments of data from experiments and tests to justify the view of many psychologists that gifted children can be educated informally if given opportunity and wise direction, and that by enrichment and intensification of studies they can be spared the mistakes incident to rapid promotion in the formal school work. The well-known author of this little book describes in a clear and simple fashion what is actually going on in the education of gifted children in the progressive schools of Cleveland. Through a period of five years Goddard has been privileged to observe this interesting work in Cleveland. He describes what he saw, discusses the principles and ideals involved, and emphasizes the applicability of these methods to the education of children generally. A few graphs show the marked superiority of the children under observation, and a final section in Part II shows the remarkable drawings of a six-year-old Japanese "genius" observed at work by Goddard in Honolulu. This book can be read as recreation in a few hours. Every teacher of whatever grade or status will profit by reading it. J. P.

Parents and Sex Education. By B. C. GRUENBERG. New York: American Social Hygiene Association, 1923. Pp. vi + 100. Price, $3.

This book was prepared by one scientifically qualified, and he has, with good judgment, candor, and proper restraint, made it valuable to all thoughtful parents and teachers who need help in this phase of education. There are seven chapters, as follows: "Why Education and Guidance With Respect to Sex Matters Are Necessary," "The Attitude Which Parents Should Maintain," "Physical Care and Personal Habits," "What the Child Should Learn and Why," "On the Nature of the Child," "Pedagogical Principles," "Supplementary Biological Information for Parents."

Elements of Qualitative Chemical Analysis. A Laboratory Guide. By WILFRED WELDAY SCOTT. New York: D. Van Nostrand Co., Inc., 1928. Pp. x + 164. Price, $1.60.

It looks practical as I turn through the pages. H. A. W.

Principles and Methods of Junior High School Mathematics. By JAMES HERBERT BLACKHURST. New York: The Century Co., 1928. Pp. xvi + 355.

An interesting and instructive discussion of teaching in this field. It seems very helpful. F. L. W.

The Singing Farmer. By JAMES S. TIPPETT. New York: World Book Co., 1927. Pp. vi + 90. Price, 68 cents.

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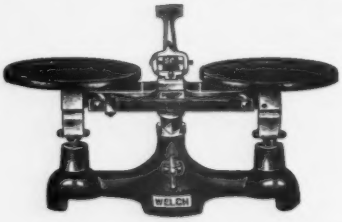

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The Techniques of Educational Research. By W. S. MONROE and MAX D. ENGELHART (University of Illinois). Bulletin No. 38, Bureau of Educational Research. Urbana: University of Illinois Press, 1928. Pp. 84. Price, 50 cents.

This is a guide to aid research workers in education. Educational research is defined as "a type of procedure employed in answering thought questions [in contrast to fact questions] about education. This procedure is one in which the best data obtainable are used and the thinking is critical." Four steps are said to be involved in such research—formulation of the problem, usually in the form of a question or a series of related questions; collection of data; analysis, organization, and summary of data; and deriving and expressing definite answers to the questions. An annotated bibliography illustrates the points made under each head. A chapter on reporting educational research is added, giving detailed instructions and references, even as to punctuation and spelling. The treatment is intolerably mechanical and formal, and may be guaranteed to kill any spark of originality in the student which may have survived the formal educational process in our schools. Nothing is said of the hypothesis (except incidentally under the last of the heads mentioned) nor of conceiving experimental methods to test it out. The monograph is doubtless valuable to a class of "researchers" now on the increase in our graduate schools. J. P.

A Teacher's Geography. By MENDEL E. BRANOM. New York: The Macmillan Co., 1928. Pp. xviii + 252.

A well-planned text for teachers colleges. It presents ably both content and theory of teaching, altogether in accord with the ideas of modern education.

A. E. P.

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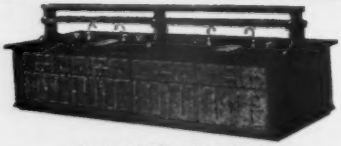

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